CHAPTER 4

Using the Evidence-Based Medicine Calculator (Expert Consult)

I. THE EVIDENCE-BASED MEDICINE CALCULATOR

An easy-to-use online calculator is provided on the Expert Consult platform, allowing clinicians to quickly calculate post-test probabilities when applying the likelihood ratios (LRs) in this book.

II. USING THE CALCULATOR

A. BLANK CALCULATOR

After opening the evidence-based medicine (EBM) calculator, the **Blank Calculator** appears (Fig 4.1). The blank calculator has three horizontal rules: **Pre-test probability**, **Likelihood ratio**, and **Post-test probability**, each with its own arrow. The clinician can move the arrows under the first two rules to indicate the appropriate pre-test probability and LR. Then, the third arrow (post-test probability) automatically displays the corresponding post-test probability. For example, dragging the pre-test probability arrow to 32% and LR arrow to 5 reveals the post-test probability to be approximately 70% (see Fig. 4.1).

B. CALCULATING PROBABILITY FOR SPECIFIC CONDITIONS

If the clinician taps the arrow to the right of the box titled **Problems** (at the top of the calculator), a drop-down list of more than 70 clinical problems will appear. By selecting any problem from this list, two additional items of information appear: (1) the pre-test probability for that particular clinical problem derived from the actual studies used in this book, with both the range and median pre-test probabilities displayed automatically on the first rule; and (2) a **View LR Value** button located in the upper right corner of the calculator (Fig. 4.2).

As an example, the clinician discovers the physical finding of *clubbing* in a patient with cirrhosis, a finding raising the possibility of hepatopulmonary syndrome (see Chapter 8). To use the calculator, the clinician first selects *Hepatopulmonary syndrome* from the drop-down list (see Fig. 4.2), which changes the appearance of the **Pre-test probability** rule to display both the range and median pre-test probabilities (or prevalence) of hepatopulmonary syndrome in patients with cirrhosis derived from the studies in this book (i.e., range: 14% to 34%; median: 18.5%). However, in our example the clinician using the calculator believes that the prevalence of hepatopulmonary syndrome in his or her own practice is slightly higher than the

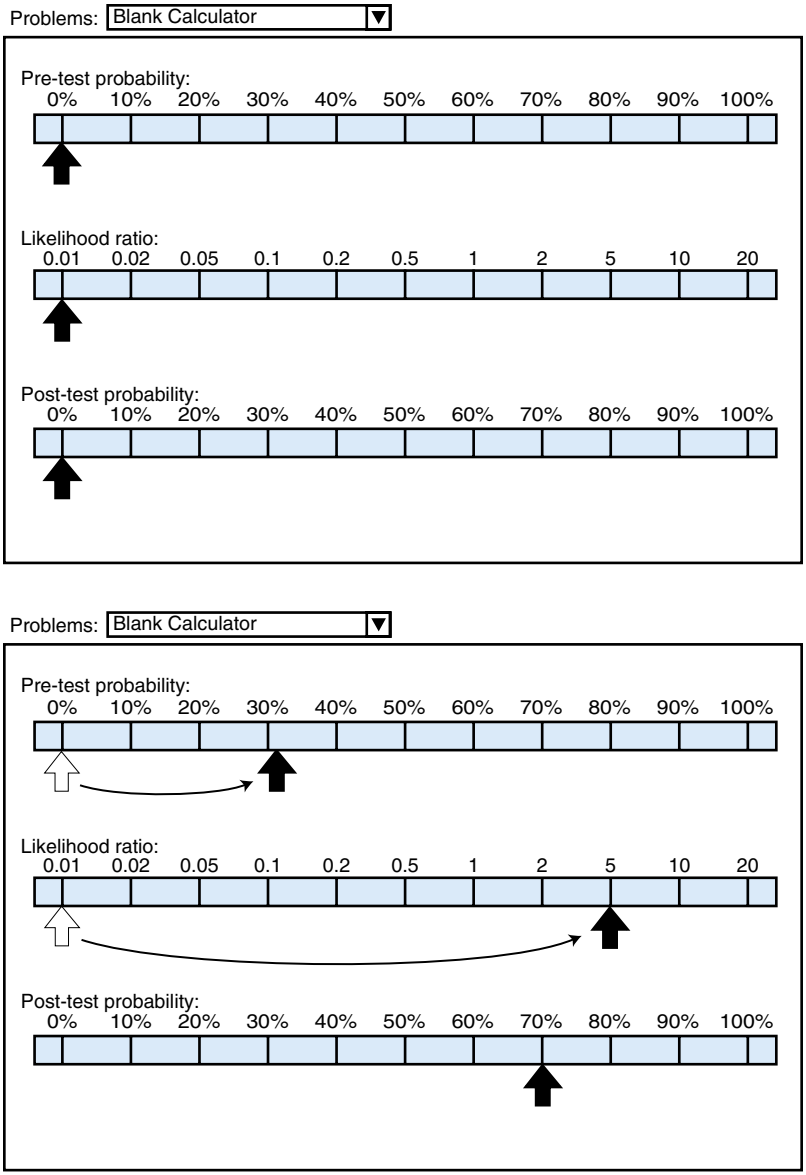
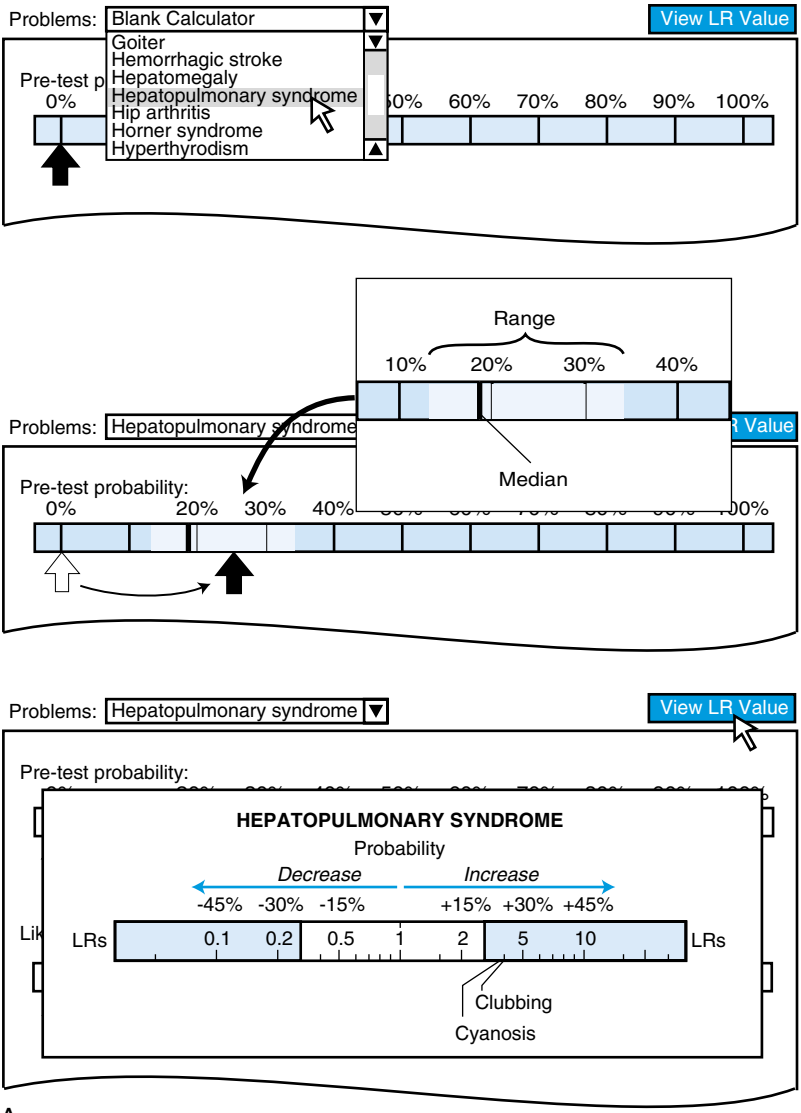
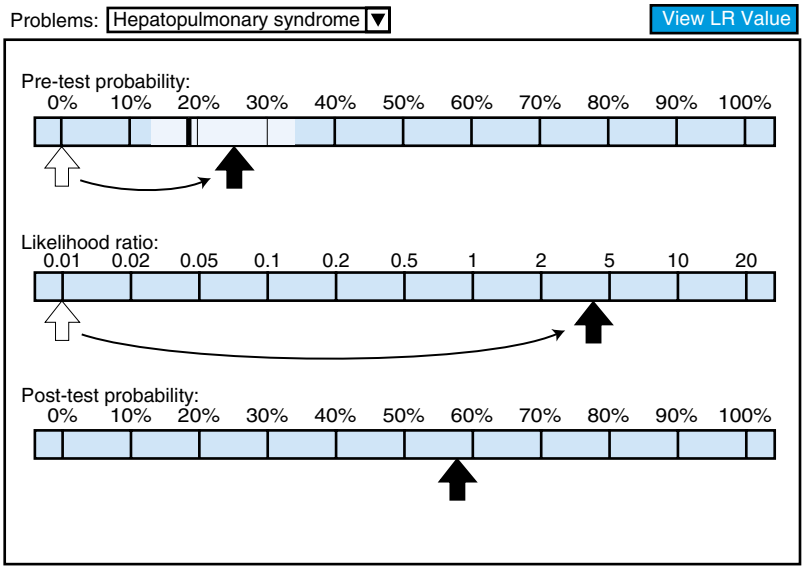


FIG. 4.1 USING THE BLANK CALCULATOR. In this example the clinician knows the pre-test probability is 32% and the finding's likelihood ratio is 5. Therefore the clinician drags the arrow under the first rule (*pre-test probability*) to 32% and the arrow under the second rule (*likelihood ratio*) to 5; the arrow under the third rule (*post-test probability*) automatically displays the corresponding post-test probability (70%).



A

FIG. 4.2 DIAGNOSING HEPATOPULMONARY SYNDROME WITH THE EVIDENCE-BASED MEDICINE CALCULATOR. Part A, this page: The clinician is evaluating a patient with cirrhosis and clubbing and wonders about the likelihood of hepatopulmonary syndrome. Selecting *hepatopulmonary syndrome* (*top*) reveals the pre-test probability in clinical studies ranges from 14% to 34%, with a median probability of 18.5% (*middle*). Believing hepatopulmonary syndrome to be more prevalent in his own practice than 18.5%, the clinician drags the **pre-test probability arrow** to 25% (*middle*) and clicks *view LR value* (*bottom*) to reveal the likelihood ratio (LR) for clubbing (LR = 4). Part B, next page: Dragging the **LR arrow** to 4 demonstrates the post-test probability of hepatopulmonary syndrome to be approximately 57% (*right*).



B

FIG. 4.2, cont'd

median (i.e., he believes it is approximately 25%). Therefore the clinician sets the **Pre-test probability** arrow to 25%. Next, the clinician clicks on the **View LR Value** button (at the upper right) to reveal the EBM Box for Hepatopulmonary syndrome (from Chapter 8). This EBM Box reveals that the LR for clubbing is 4. After dragging the **LR arrow** to 4, the calculator indicates that the post-test probability of hepatopulmonary syndrome (in this clinician's patient with cirrhosis and clubbing) is 57% (see Fig. 4.2).

Following the rules discussed in Chapter 2, the clinician may combine findings using this calculator by simply transferring the post-test probability from the first finding to the pre-test probability rule of the second finding (see the section on Combining Findings in Chapter 2).